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# ENTOMOLOGICAL NEWS

Vol XXXI. No. 5

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# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXXI. MAY, 1920. NO. 5.


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## Cotton Insects in Porto Rico.*


By E. GRAYWOOD SMYTH,

Entomologist, Insular Experiment Station, Rio Piedras, P. R.


Very little having been published concerning the insect pests of cotton occurring in Porto Rico, it is the object of this paper to present a brief discussion of the species that feed upon this crop, whose growing importance on the Island is recognized.

It should be said that no evidence has yet been found of presence of the dreaded pink boll worm, *Pectinophora gossypiella* Saun., though the pink scavenger worm, *Pyroderces rileyi* Wals., is frequent enough, and does no perceptible damage. The common boll-worm, *Chloridea obsoleta* Fab., while a not uncommon pest of corn on the Island, has not

*Published by permission of the Director of the Station.

been observed by the writer attacking cotton. A report of severe damage from its attack reached the Station from the Haltillo district during July, 1919, but specimens accompanying the letter proved to be those of the leaf caterpillar, *Alabama argillacea* Hübn., the two species having been confused. Even as a pest of green ear-corn, the boll-worm is considerably less important on the Island than the southern grass-worm, *Laphygma frugiperda* S. & A., which in several islands of the West Indies is known locally as the corn ear-worm.

The cotton leaf caterpillar often becomes locally a serious menace to cotton raising. To combat it by means of arsenicals, by the dusting method, as is done in the Southern States, is too expensive for the average cotton grower of the Island, who is usually so lacking in funds as to be unable to buy even his seed, which must be furnished by contract. He is therefore advised to use a much cheaper but equally effective method of control, namely, the cutting down and destroying of the moth's wild food plants between cotton crops. Principal of these are two weeds, *Urena lobata* and *Malachra rotundifolia*, both Malvaceous, the former much the more abundant, and the more noxious from its habit of attracting large numbers of the fire-ant, *Solenopsis geminata* Fabr., because of the three small honey-ducts on the underside of each leaf. It is unfortunate that this plant is considered highly medicinal by the natives, and with difficulty are they persuaded to cut it down. The weed grows in considerable beds when permitted and the writer has collected as many as 52 larvae from four plants (on July 16, 1916), showing how the weed may facilitate the moth's multiplication. In many cotton sections of the States this moth breeds continuously upon cotton, hibernating over winter at end of the cotton season, and flying forth in spring in time to invade the new crop. There it needs no alternate host plant. But in Porto Rico conditions are different, there being a long period between cotton crops during which the moth cannot hibernate, so must breed on other plants. *Urena lobata* not only tides over this gap, but allows the moths to greatly multiply in numbers between cotton crops, it being in many regards a more favorable food plant for the larvae than cotton.

The common cotton stainer of the Island seems to be *Dysdercus andreae* L., which is much more frequently found in the drier northwest and south coast sections, than along the humid northeast and east coast. While the bug is sometimes locally abundant, it may at other times be entirely missing in a cotton field, so on the whole cannot be considered a serious pest of the crop.

During the past winter (December and January) the writer has had opportunity to make a close study of the cotton insects in a field on the Insular Experiment Station grounds at Rio Piedras. Needless to say, the pink boll worm and boll weevil have been entirely absent; and we have yet to discover these two pests on the Island. It was a surprise, however, to have found only two leaf caterpillars (*Alabama argillacea* Hubn.) on the plants in the whole winter, in view of the fact that *Urena lobata* has grown abundantly in the neighborhood through the summer, and was subject to considerable attack. The reduction of the pest may be accounted for by the prevailing dampness of the weather in conjunction with some disease. The common boll-worm has been another pest missing, although infected ears of corn have been found growing very near the cotton. An occasional larva of the tropical cutworm, *Xylomiges sunia* Guen., has been found attacking foliage, but this may be considered accidental, as the larva much prefers garden crops, amaranth and morning glory.

The most injurious pest has been the greenhouse thrips, *Heliothrips haemorrhoidalis* Burm. Larvae and adults gather in some numbers on the outside of bolls, underneath the calyx, where they scarify the surface and cause white scars that later turn brown, and seem to be immediately concerned in the attack of a disease that somewhat discolors the bolls and causes the calyx to cement itself to the outside of the boll, preventing the latter from bursting properly. The preceding generation of this thrips was found in November attacking the undersides of grapefruit leaves, where it occurred in all stages and caused a considerable scarring, and some malformation, of the foliage. A careful search for them on citrus, in latter part of January, revealed only four adults and no

young, and three of the adults were dead, adhering to lower surface of leaf. These have been confined, with the hope of rearing internal parasites. The greenhouse thrips has been reported attacking citrus foliage in Florida, California (on plants from Massachusetts), Demerara, and Sicily, but has not been previously reported as a cotton pest to our knowledge.

Another insect very common on cotton bolls, and infesting probably thirty per cent. of them, is the destructive mealybug, *Pseudococcus virgatus* (Ckll.), which during the summer very heavily infested lima beans on vine and leaves, and to some extent pepper foliage. It was at that time heavily parasitized by a small Cecidomyid, probably *Karschomyia cocci* Felt, the adults of which display the strange habit of hanging in rows festooned on strands of spider web, where they perform a rocking motion by means of the wings. On cotton the mealybug occurs in all stages, the egg masses and young being especially plentiful, protected beneath the base of calyx. One or two bolls were turned quite white beneath the calyx by their cottony secretions. A very few specimens of *Ps. citri* (Risso) were found on the bolls, and one specimen of *Ps. longispinus* (Targ.). A number of adults of an undetermined scale, very close to *Coccus mangiferae* (Green), were found infesting the inside of the calyx on cotton bolls.

The lace-bug, *Corythuca gossypii* Fab., has done injury to an occasional cotton leaf, but is very much more injurious to the foliage of adjoining castor-bean and lima bean plants. On the last two this insect is a pest of first importance, but on cotton it is of little consequence. More important than the Tingid has been the cotton aphis, *Aphis gossypii* Glov., though the attack is light and scattering, due to the activity of its natural enemies. They include the following, named in about the order of their importance: *Cycloneda sanguinea* L.; *Scymnus roseicollis* Muls.; a white fungus, *Agrostalagmus albus*; a Braconid parasite, that turns the body of the aphis light brown; a Chalcidid parasite, that turns the body jet black; a Chrysopid, and a species of *Hyperaspis*. In very wet weather, the white fungus usually becomes the most

efficient of the parasites, and preys upon all of the commoner aphides. The large lady-beetle, *Cycloneda*, is greatly hampered in its multiplication by the attack of an Encyrtid hyperparasite, *Homalotylus* sp., and the black, mummied larvae containing these parasites, or their exit holes, may often be found under the calyx on the boll.

The green flower beetle, *Diabrotica graminea* Balz., is often seen eating cotton blossoms or foliage, and the larvae doubtless attack the roots to some extent. This beetle is very fond of Malvaceous plants, and is a serious pest of okra blossoms and leaves in July.

Occasional nymphs and adults of a species of *Empoasca* not yet determined, have been found on foliage and bolls. Two adults of the Membracid, *Antianthe expansa* (Germ.), one adult of a species of *Agallia*, and occasional adults of *Oliaris* sp., which is a very general feeder, have been found on terminal stems.

Nymphs of the green bug, *Nezara viridula* (Linn.), in the early instars, were found under the calyx on many cotton bolls in early January, and the adults began to appear in latter part of the month. This bug was not noticed earlier in the year 1919. Although it is recorded as a pest of cowpeas and tobacco in Florida, and of tomato in Jamaica, it has not been observed in Porto Rico to attack any of these plants, which have been growing in immediate vicinity of the cotton. The presence of the green bug in a cotton plantation should be looked upon with apprehension, in view of the fact that it has been proven to be a purveyor of cotton anthracnose in Georgia, and of an internal disease of the cotton boll in Barbados and neighboring islands.

Lepidopterous larvae of small size have been found feeding and webbing beneath the calyx on cotton bolls, and are being reared for the determinations. None of them, however, resemble the pink boll worm.

# The Genus Timema Scudder, with the Description of a New Species, (Orthoptera, Phasmidae, Timeminae.)

By Morgan Hebard, Philadelphia, Pa.

The genus *Timema* was described by Scudder in 1895,[1] based on a single species, *californicum*, from California. In 1903, Caudell furnished the first detailed description of the species, which had been sent him by Scudder, and proposed the subfamily name Timeminae, the subfamily being restricted to this single genus. He also discussed and figured material from Los Angeles County, California, the differences found being noted as possibly showing the presence of a distinct species, but the material at hand was considered in too poor a state of preservation to warrant description.

From the larger series now available, we find the southern Californian insect to be a distinct species, differing very strikingly in constant features of the genitalia.

The genus *Timema* was said to be closely allied to *Agathemera* by Scudder and characterized as "maxime affine" by Redtenbacher,[2] the latter ignoring Caudell's subfamily Timeminae.

Considering the complete median segment, which is in no way more closely attached to the metanotum than to the succeeding tergite; the three jointed tarsi, and the limbs so attached ventrad that the coxae can not be seen from above, we believe that the subfamily Timeminae is valid. In fact it may be characterized as the most aberrant subfamily from the conventional Phasmid type.

The genus does find nearest affinity with *Agathemera*, though the relationship is decidedly remote.[3] In addition to the features given above, *Timema* is distinguished by both sexes being completely apterous, the tarsal claws are slightly

[1]Can. Ent., XXVII, p. 30.

[2]Insektenfam. Phasmiden, p. 88, (1908).

[3]Comparison is made with more than one species of *Agathemera* in the collection of the Academy of Natural Sciences of Philadelphia.

asymmetrical and the large arolium is produced as far as the apex of the longer tarsal claw. The species of *Timema* are furthermore much smaller than those of *Agathemera*.

**Timema californicum** Scudder

1895. *T(imema) californicum* Scudder, Can, Ent., XXVII, p. 30. [Santa Cruz, California.]

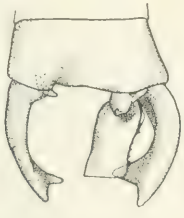
1903. *Timema californicum* Caudell, Proc. U. S. Nat. Mus., XXVI, p. 883, pl. LVII, fig. 5, pl. LVIII, fig. 7. (In part.) [♂, ♀; Santa Cruz Mountains, California.]

1903. *Timema californica* Caudell, Ent. News, XIV, p. 316. [[juv.] ♀; Humboldt County, California.]

1908. *Timema californicum* Redtenbacher, Insektenfam. Phasmiden, p. 88. (No additional material.)

1913. *Timema californica* Caudell, Proc. U. S. Nat. Mus. XLIV, p. 613. (No additional material.)

The species is best discussed by Caudell in his first paper in 1903, the detail figures there given being, however, very poor.



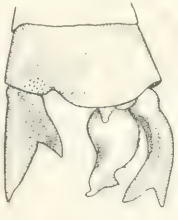


Fig. 1. *Timema californicum* Scudder. Mount Tamalpais, California, Male. Dorsal view of distal portion of abdomen. (Much enlarged.)

Fig. 2. *Timema chumash* new species. Los Angeles County, California. Male. *Type.* Dorsal view of distal portion of abdomen. (Much enlarged.)

Later that year Caudell gives all the data yet recorded as to the habits of this singular insect. According to that author, on June 9th to 16th, 1903, Mr. H. S. Barber beat nineteen females from fir trees (at Bair's Ranch on Redwood Creek) in Humboldt County, California, at an elevation of about 1400 feet. The individuals were reported to be green like the fir needles, which they resembled so closely as to be scarcely discernable as long as they remained motionless, which they did for some time after having been beaten into the net. All were taken from the lower branches of a clump

of large trees, which stood somewhat apart from the denser woodland.

Measurements in Millimeters

| ♂ | Length of body | Length of pronotum | Width of pronotum | Length of caudal tibia |
|---|---|---|---|---|
| Mount Tamalpais, Cal.... | 12.5 | 1.9 | 2.7 | 3.4 |
| Fairfax, Cal..... | 14.5 | 1.9 | 2.7 | 3.8 |
| Carmel, Cal..... | 12.7 | 1.9 | 2.7 | 3.7 |
| ♀ | | | | |
| Guerneville, Cal..... | 20.8 | 3.1 | 4. | 6. |
| Fairfax, Cal..... | 17.7 | 2.4 | 3.4 | 4.2 |
| Oakland, Cal..... | 19.8 | 2.6 | 3.4 | 4.7 |

The male genitalia and female penultimate tergite and cerci are distinctive for the species. The former are shown by text figure 1, while under *T. chumash*, here described, other features characteristic of this species are discussed.

In males some variation in the form of the genitalia is found, though the type is constant, showing no divergence toward that developed in *chumash*. Thus the disto-internal production of the cerci varies individually from the type figured to one in which these portions are broader, this portion of the sinistral cercus in a male from Monterey County being distinctly broader than long with margin convex to the rather broadly rounded apex. Furthermore the sinistral cercus is produced proximad near the base, so that the internal margin beyond the basal tooth is developed into a distinct flange, while the meso-dextral elongate plate is much constricted mesad. These differences we believe are of no further importance than indicating the degree of variation to be expected in the male genitalia of the species.

In females the cerci are elongate, leaf-like, cochleate plates, obliquely truncate at their apices, with internal surfaces roughly denticulate toward the dorsal margin. The distal margin is smooth.

We are consequently not fully satisfied that the female from Kings River, in Fresno County, represents this species. Though agreeing with the others here recorded in the form of the penultimate tergite, the cerci show a broader and less

oblique distal truncation, as found in *chumash*, the margin being there moderately denticulate, about intermediate between the typical conditions found in *californicum* and *chumash*. The presence of a geographic race or distinct species in the southern Sierras is a possibility which additional material, including adult males, alone can determine.

Though we have consistently endeavored to secure material of this genus whenever working on the Pacific Coast, all efforts have been unsuccessful.[4]

The species is now known from Bair's Ranch on Redwood Creek in Humboldt County, California, southward along the coast as far as Carmel in Monterey County. It is also found in the Sierras, being here recorded from the vicinity of Lake Tahoe, in Eldorado County, and from Kings River, in Fresno County. As is true for many secretive species, the actual distribution of this insect is probably considerably more extensive than as at present defined.

*Specimens examined*, in addition to 6 previously recorded: 28; 8 males, 17 females, 3 immature individuals.

CALIFORNIA. Corralitos, Redwood, Santa Cruz Mountains, May 13, 1907, (J. C. Bradley), 1 juv. ♀, [Cornell Univ.]. Guerneville, Sonoma County, May 31, 1910, (E. C. Van Dyke), 1 ♀, [Hebard Cln.]. southern Sonoma County, August 31, 1910, (J. A. Kusche), 1 ♀, [Cal. Acad. Sci.]. Fairfax, Marin County, May 7, and 11, 1911 and 1919, (E. C. Van Dyke; E. P. Van Duzee), 4♂, 4♀, [Cal. Acad. Sci., and Hebard Cln.]. Mount Tamalpais, June 20, 1909, (E. C. Van Dyke), 1♂, [Cal. Acad. Sci].. Niles Canyon, July 15, 1916, (E. P. Van Duzee), 1♀, [Cal. Acad. Sci.]. Oakland, May 14, 1911, (E. C. Van Dyke; hills back of city) 3♀; (C. D. Haines) 1♀, [Cal. Acad. Sci., and Hebard Cln.]. Corte Madero Creek, Palo Alto, April 4, 1915, (H. Morrison), 1 juv. ♀, [U. S. N. M.]. Carmel, Monterey County, May 19 and 21, 1911 and 1913, (E. C. Van Dyke), 2♂, 3♀, [Cal. Acad. Sci., and Hebard Cln.]. Monterey County, (M. K. Curran), 1♂, 2♀, [Hebard Cln.]. Fallen Leaf Lake, Lake Tahoe, Eldorado County, July 1, 1915, (E. C. Van Dyke). 1 juv. ♀, [Cal. Acad. Sci.]. Paradise Valley, Kings River, Fresno County, 6500 feet, July 23, 1910, (E. C. Van Dyke), 1♀, [Hebard Cln.].

[4]From the data at hand the species of *Timema* appear to be spring forms, reaching their greatest numerical abundance in May or June. Our Californian work has all been accomplished much later in the season, this probably in large part accounting for our failure to find the insects.

**Timema chumash**[5] new species

1903. *Timema californica* Caudell, (in part not of Scudder, 1895), Proc. U. S. Nat. Mus., XXVI, p. 883, pl. LVIII, fig. 7a. [♂, ♀, Los Angeles County, California.]

Males of the present species agree closely with those of *T. californicum* Scudder, except in the strikingly different genitalia. In the female sex the genitalia likewise show differences, which, however, are by no means as distinctive.

The insect occurs in the mountains and adjacent regions of southern California, far south of the known limits of distribution of *californicum*.

TYPE: ♂; Los Angeles County, California. [Hebard Collection, Type No. 533.]

Agrees closely with males of *californicum*, differing only in the more robust structure and in the following genitalic features.[6] Penultimate tergite produced dextro-distad more than sinistro-distad, in such a way that the dextral margin is slightly more oblique to a medio-longitudinal line than the sinistral margin; distal margin broadly convex to a small but rather decided concave emargination, situated sinistro-mesad before the base of the sinistral cercus, the brief portion of this margin above the sinistral cersus straight, transverse, the surface of the plate toward the internal portion of this section supplied with denticulations in a small oval area. Sinistral cercus broad lanceolate with apex acute, lacking a basal tooth but flattened proximo-internally, this portion with lateral margin diverging and produced into a large acute-angulate projection mesad, about half as large as the remaining distal portion of the shaft. Dextral cercus a heavy, evenly in-bowed shaft of equal length, bifid distad with internal portion of this section and larger than the external portion; shaft bulbous proximo-externally. This cercus is much more like the dextral cercus of *californicum*, differing principally in the bulbous proximo-external section. Adjacent to and sinistrad of the dextral cercus is a large, lamellate plate, extending caudad almost an equal distance, irregular in contour and strongly constricted meso-distad, the dextral margin of this plate being armed with well spaced, sharp, recurved teeth. Above this plate is a very small irregularly rotundato-conical projection.[7] Me-

[5]The Chumash were an Indian tribe which, at the time of the Spanish conquest, inhabited the region in which this species is found.

[6]Reference to text figure 2 is advisable, due to the high specialization of these parts.

[7]In *californicum* the homologous projection is larger, more bulbous, with apex produced dorsad in a small conical process, as shown in text figure 1.

sad, from beneath the penultimate tergite, project two small, irregular, rotundato-trigonal plates. These are sometimes concealed and apparently represent the supra-anal plate (tenth tergite, not counting the median segment, which, in the species of *Timema*, is of the same form as the first tergite). Subgenital plate scoop-shaped, with apex weakly obtuse-angulate emarginate.[8] Styles absent.

ALLOTYPE: ♀; Los Angeles County, California. June. (D. W. Coquillett.) [United States National Museum.]

Very similar to females of *californicum*, apparently differing only in genitalic features. Size considerably larger than in male. Penultimate tergite roundly produced mesad,[9] so that only the distal portion of the very small trigonal supra-anal plate is exposed. Cercus elongate, cochleate, very broadly truncate at apex, this truncation very weakly oblique and with margin strongly but irregularly dentate.

MEASUREMENTS IN MILLIMETERS

| | Length of body | Length of pronotum | Width of pronotum | Length of caudal tibia |
|---|---|---|---|---|
| ♂ | | | | |
| Los Angeles County, Cal. *Type*... | 14. | 2.3 | 3.3 | 4. |
| Los Angeles County, Cal. *Paratype* | 13.5 | 2.2 | 3. | 4.2 |
| Mount Wilson, Cal. *Paratype*..... | 13.7 | 2.4 | 3.7 | 4.3 |
| ♀ | | | | |
| Los Angeles County, Cal. *Allotype*. | 21. | 3. | 4. | 4.8 |
| Los Angeles County, Cal. *Paratype* | 20. | 2.7 | 3.9 | 4.8 |

From the available data the distribution of the present species would appear to cover the mountains in the Los Angeles region, extending down their eastern slopes into decided desert conditions, as is shown by material taken at Palm Springs, in the Mojave Desert at the foot of the San Jacinto Range.

*Specimens Examined:* 9; 3 males, 2 females and 4 immature individuals.

CALIFORNIA. Los Angeles County, 1 ♂, *type*, [Hebard Cln.]; June, (D. W. Coquillett), 1 ♂, 2 ♀, 1 juv. ♀ *allotype* and *paratypes*, [U. S. N. M. and Hebard Cln.]. Mount Wilson, near summit, June 6, 1916, (H.

[8]In *californicum* the subgenital plate is weakly scoop-shaped, with apex broadly and weakly convex.

[9]In *californicum* the penultimate tergite is moderately angulate-emarginate, so that a larger portion of the very small trigonal supra-anal plate is exposed.

Morrison; swept from *Ceanothus*), 1 ♂, [U. S. N. M.]. Keen Camp, San Jacinto Mountains, June 6 to 12, 1917, (E. P. Van Duzee), 1 juv. ♂, [Cal. Acad. Sci.]. Palm Springs, May 21, 1917, (E. P. Van Duzee), 2 juv. ♀, [Cal. Acad. Sci., and Hebard Cln.].

## Descriptions of New Species of Hesperidae (Lepidoptera).

By Henry Skinner, Philadelphia, Pa.

The types of the following species are in the collection of The Academy of Natural Sciences of Philadelphia.

**Pyrrhopyge viriditas** n. sp.

Head, collar and palpi red. Thorax blue above, black below. Abdomen and legs black. Anal tuft orange. Wings dark green above and below. Fringes yellow; very narrow on the primaries and a little more than 1.5 mm. wide on the secondaries. Expanse (one wing) 27 mm.

One specimen from San Pedro, Sula, Honduras. This species belongs to the group containing *telassa* and *hadassa* Hew.

**Mimoniades aemulus** n. sp.

Head, palpi, thorax and abdomen black. Patagia slightly tipped with orange. Primaries marked as in *pityusa* Hew. except that the two vitreous spots in the centre of the wing are differently shaped, the upper spot being elongate and the lower one has an indentation on the outer side. Inferiors as in *pityusa*. Underside as in *pityusa* except that the primaries have no markings other than the vitrous spots, and on the secondaries the narrow submarginal line is wanting. Expanse of one wing 31 mm.

One male specimen from Ambato, Ecuador. This species differs from its allies in the black body and abdomen and also in the character of the central vitreous spots.

**Mimoniades amans** n. sp.

Head, palpi, thorax, abdomen and legs mostly black with a few whitish hairs interspersed here and there on the underside. A broad orange, vitreous band extending from the costa to the submedian nervure, which is 6 mm. in width; the remainder of the wing is immaculate and black. The secondaries are black with blue scales extending parallel to the margin and 4 mm. from it, and also a faint line of these blue scales running the same distance from the interior margin. In the medial part of the wing

they extend about 13 mm. toward the base. The primaries below are dusted with blue scales and there are three white spots at the base of the wing. Secondaries covered with blue scales and with a white fascia near the base of the wing. Expanse of one wing 28 mm.

One specimen from Neiva, United States of Colombia. The species is related to *ocyalus* Hubn.

**Proteides jamaicensis** n. sp.

Closely related to *idas* Cramer and on the upperside marked in the same way. The vitreous spots are variable, in some cases large and in one specimen the wings are almost immaculate, as in some specimens of *sanantonio* Lucas. The differences are on the underside of the secondaries where markings are in general as in *idas* but the white scales are almost entirely lacking and this gives the wings quite a different appearance. It is a large form and in some of the specimens one wing measures 35 mm.

The *type* and four other specimens from Jamaica.

**Thymele angustus** n. sp.

Head green. Upperside of palpi brown, underside orange. Front femora orange. Thorax and abdomen green, below brown. The primaries have the usual diaphanous band of spots; two on the costa, a narrow hour-glass shaped one in the cell and a small triangular one below. Inner third of wings blue. Secondaries brown with inner third blue. Underside of primaries as above with secondaries brown, immaculate. Expanse of one wing 26 mm.

The *type* and two other specimens from San Domingo, West Indies. This striking species is related to *fulgerator* but may be readily distinguished by the very narrow diaphanous band of spots only 1 mm. wide.

**Telegonus antiquus** n. sp.

Head, palpi and underside of thorax brown. Upperside of thorax and abdomen green. Primaries brown with the basal third blue. Secondaries brown with the inner half blue. Underside brown with obscure darker markings and a few faint pink scales on the outer margins of the wings. Expanse of one wing 26 mm.

The *type* and one other specimen from San Domingo, West Indies. The species is related to *T. habana* Lucas but lacks the whitish border of the underside of the wings.

**Bungalotis immaculata** n. sp.

The whole insect is yellowish brown, nearly the color of *B. midas* Cramer and is without markings. The antennae, head, palpi, thorax, abdomen

and legs concolorous. Inserted near the base of the secondaries is a tuft of brown hairs. Expanse, one wing, 23 mm.

*Type* from Chanchamayo, Peru.

**Bungalotis canalis** n. sp.

A yellow-brown species the color of *ramusis* Cramer and the markings are of the same general color. The specimen is a male and has a costal fold. Antennae, head, palpi, thorax, abdomen and legs yellow-brown. Upperside: Primaries with a small, round, sub-apical vitreous spot and several very faint brown spots between the veins; the secondaries have a geminate brown spot at the end of the cell and five small brown spots half way between this and the border, and running parallel to the border. Underside of primaries much as above; secondaries have a medial row of three obscure, brown spots and a postmedial row of six brown spots. Expanse of one wing 28 mm. Costa of hind wing 21 mm. External margin 22 mm. Internal margin 23 mm. These measurements show that the species is different in shape from some of the species in the genus.

The *type* is from Gatun, Canal Zone, Panama. From D. E. Harrower.

**Eudamus parvus** n. sp.

Head, thorax and abdomen above, brown; below the palpi are covered with mixed brown and whitish hairs. Abdomen below brown. Upperside: Primaries dark brown and immaculate; secondaries brown and immaculate, terminating in short tails. Underside: The primaries show very faint mottlings; the secondaries have a faint central band, darker than the background and also a submarginal one of the same character. Expanse of one wing of male, 13 mm., of female 20 mm. Tail 5 mm. in length.

The *type* male has no vitreous spots and the type locality is St. Pierre, Martinque (J. M. Geddes, Dec. 8th, 1911.) *Allotype* from the same locality and paratypes from Antiqua, Dec. 23rd, 1911, (Geddes). English Harbor, Antiqua (Geddes) Dominica (Geddes). This little species has the same odd shape as *E. galapagensis* Williams, described in the Proc. Calif. Acad. Sci., 1911, p. 303, pl. 20, f. 6.

**Callimormus dimidiatus** n. sp.

Head black; antenna annulated, black and white; palpi with black and white hairs. Thorax and abdomen brown above, white below. Legs partly covered with white scales. Upperside: Primaries brown with three small orange lines near the apex and a subcostal one from the inner third to the base of the wing; secondaries brown, immaculate. Under-

side: Primaries brown with a very narrow yellow line below the costa and extending from near the middle of the wing to the base; on the outer half of the costal margin and on the outer margin are about ten yellow lines. Secondaries with a subcostal yellow line and below this is another one, bifid from the middle to the outer margin of the wing. The lower two-thirds of the wing is white with five or six narrow fuscus lines in it. Expanse of one wing 12 mm.

*Type*, a male from Huigra, Ecuador, (S. N. Rhoads). This is a very pretty and graceful little species. *Gracilis* Felder appears to be its nearest ally.

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## The known Membracidae of Ecuador (Homop.)

By Dr. FREDERIC W. GODING, Guayaquil, Ecuador.

During a residence of more than six years in Ecuador, collectors have been supplying material from which this list of forty-five species of Membracidae is based, while heretofore but eight had been recorded; those in my collection are indicated by an *. Representatives of the subfamily Centrotinae have not been identified from this Republic. Types of the new species here described are in my collection.

TRAGOPINAE.

***Horiola picta** Fabr. Coq. Ill. Ins. ii, p. 78, pl. 18, f. 10. *Hab.:* Ana Maria Farm, Province of Los Rios, (Rorer).

***Horiola lineola** Fabr. Syst. Ryn. p. 30. *Hab.:* Ana Maria Farm, Province of Los Rios, (Rorer).

***Horiola arcuata** Fabr. Syst. Ryn. p. 29. *Hab.:* Ana Maria Farm, Province of Los Rios, (Rorer).

SMILIINAE.

***Cyphonia clavata** Fabr. Mant. Ins. ii, p. 264. *Hab.:* Machala, Province of El Oro, (Rorer).

**Antonae guttipes** Walk. List Hom. Brit. Mus., Suppl. p. 157. *Hab.:* Napo River, Province of El Oriente, (Walker).

**Centrogonia centrotoides** Walk. List Hom. Brit. Mus., Suppl. p. 138. *Hab.:* Napo River, Province of El Oriente, (Walker).

***Centrogonia flavo-limbata** n. sp. (See description on another page.) *Hab.:* Pifo, Province of Pichincha, (Campos).

**Acutalis (?) terminalis** Walk. Ins. Saund. Hom. p. 76. *Hab.:* Province of Pichincha, (Distant).

*Polyglypta dorsalis Burm. Silb. Rev. Ent. iv, p. 178. *Hab.:* Province of El Oriente, (Goodfellow).

*Erosne bracteata Stal. Bid. Mem. K. p. 240. *Hab.:* Machala, Province of El Oro, (Rorer).

*Heranice miltoglypta Fairm. Rev. Mem. p. 306, pl. 5, f. 4 and 12. *Hab.:* Machachi, Corazon, Province of Pichincha, (Distant); Cañar, Province of Cañar, (Pachano).

**Hille equadorensis** Fowl. Tr. Ent. Soc. Lond. (1894), p. 420. *Hab.:* Ecuador, (Fowler).

*Hille sobria Walk. List. Hom. Brit. Mus. p. 523. *Hab.:* Quito. Province of Pichincha, (Walker); Province of El Oriente, (Goodfellow).

**Hille perfecta** Walk. List Hom. Brit. Mus., Suppl. p. 139. *Hab.:* Napo River, Province of El Oriente, (Walker).

*Ecuatoriana bactriana n. gen. et sp. (See description on another page.) *Hab.:* Zuñas, Province of Chimborazo, (Feyer).

*Oxygonia chrysura Fairm. Rev. Mem. p. 302, pl. 5, f. 18. *Hab.:* Province of El Oriente, (Goodfellow).

*Oxygonia erythropus Burm. Handb. Ent. ii, p. 139. *Hab.:* Province of El Oriente, (Goodfellow).

**Oxygonia rufo-maculata** Fallou. Rev. d' Ent. ix, p. 353. *Hab.:* Ecuador, (Fallou).

**Oxygonia fasciata** Fallou. Rev. d' Ent. ix, p. 353. *Hab.:* Ecuador, (Fallou).

*Adippe histrio Walk. Ins. Saund. Hom. p. 71. *Hab.:* Province of El Oriente, (Goodfellow).

**Lucilla intermedia** Fowl. Tr. Ent. Soc. Lond. (1894), p. 421. *Hab.:* Ecuador, (Fowler).

### Darninae

*Aconophora pugionata Germ. Mag. Ent. iv, p. 20. *Hab.:* Ana Maria Farm, Province of Los Rios, (Rorer).

*Hyphinoe morio Stal. Bid. Mem. K. p. 257. *Hab.:* Posorja, Province of Guayas, (Campos).

*Tomogonia camposiana n. sp. (See description on another page.) *Hab.:* Posorja, (Campos).

**Heniconotus aethiops** Butl. Cistula Ent. (1877), p. 361, pl. 7, f. 13. *Hab.:* Ecuador, (Butler).

### Hoplophorinae

*Triquetra bos Fairm. Rev. Mem. p. 282. *Hab.:* Province of El Oriente, (Goodfellow).

*Triquetra nigro-carinata Fairm. Rev. Mem p. 280. *Hab.:* Normandie, Province of El Oriente, (Feyer).

(*To be Continued*)

# ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., MAY, 1920.

### Remember the Veterans!

A correspondent writes:

It has occurred to me that the entomologists of this country should in some way show their appreciation of those men whose active work is ended, and not let them pass by, as is usually the case, until it is too late. Dr. Behr and Prof. Rivers both passed away apparently forgotten and (I cannot help feel) with just a little bitterness that their last days should be passed in utter oblivion. The ending of Rivers was especially sad for, after the death of his wife, to whom he was intensely devoted, he began drinking heavily, merely as a means to hasten the end. Perhaps just a bit of appreciation from those now active in the various fields of entomology would have brightened his days, lessened the great sorrow that came to him, and made him feel that his efforts had not been entirely in vain.

It seems to me that a day could be appointed when, each year, those who have done their bit for the advancement of science could be remembered and congratulated. A mere pittance from a few of us would be sufficient to send to those who have retired a tribute in the way of flowers and a two cent stamp would carry a written message of congratulation and appreciation. I sincerely hope that my suggestion will lead to something along this line.

We heartily approve of these sentiments and hope that they may be carried into effect by individual action, even if concerted effort does not obtain. The veteran to be cheered would be most appropriately remembered on his own birthday. If one day in the year were appointed for this tribute to all the workers, the first suggestion which comes to us is that of the birthday of Thomas Say, the "father of American Entomology," July 27. That his natal day falls in a period when many entomologists are in the field, away from home and therefore not situated as to conveniently carry out this kindly idea, makes the wisdom of such a choice doubtful. We shall be glad to receive suggestions.

# Notes and News

## ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

### Change of Address

Mr. Richard T. Garnett has removed to 625a 14th Street, Oakland, California.

### Notes on the Habits of Promecognathus laevissimus Dejean. (Col., Carabidae.)

After noting several crushed *Scaphinotus* on the paths in a damp ravine on the campus of the University at Berkeley, I sank a Mason jar into the ground in a little runway that led down to the stream. This runway was surrounded on either side by a heavy carpet of English ivy. The trap was baited with scraps of meat, but in the three months that have elapsed not a single *Scaphinotus* has been taken; the only species that have fallen victims are *Promecognathus laevissimus* Dej., *Pterostichus vicinus* Mann., and *Omus californicus* Esch. The presence of *Promecognathus* in a trap in the open is surprising, insomuch as it is commonly supposed to lead a strictly subterranean life. Even when daily visits were made to the jar (whether it was baited or not) there were always at least a pair of them trapped, showing that this pugnacious Carabid is in the habit of taking nocturnal strolls. But one specimen of *Omus* was taken in this way.—Richard T. Garnett, Oakland, California.

### Notes on North Carolina Dragonflies (Odonata)

**1. Enallagma geminatum.** About three dozen specimens were taken by Prof. C. H. Kennedy and myself on June 17, 1919, on some old brickyard ponds near Raleigh. Among these were a number which had the sides of the second abdominal segment mainly black with an anterior wedge-shaped blue stripe and a posterior blue semicircle, which when enlarged and connected cut off the usual oblong black spot on the segment. Another specimen was taken on July 10 at same place.

**2. Gomphus parvidens** B. M. Currie. A male *Gomphus* taken at Southern Pines, April 29, 1908, and recorded by me as *G. brimleyi* in Ent. News for June, 1918, proves to be this species. The female from Raleigh referred to *brimleyi* in the same article also seems to be this species as does also a female from Lumberton, the only remaining one of the three Lumberton *Gomphus* referred to *brimleyi* in Ent. News, June, 1918, to *abbreviatus* in the News, March, 1906, and to *parvulus* in the News, March, 1904.

**3. Libelula incesta.** For several years I have noticed that along with the usual clearwinged *incesta*, there occurred a form similar in every respect, but with the basal streaks present or the postcubitals infuscated

or both, but I was not clear whether this was a mere variation of *incesta*, a dwarfed form of *axillena*, or something else, so having some spare time in the summer of 1919 I tried to settle the matter for myself.

Upon overhauling what Raleigh material I had both pinned, papered and wet preserved, I found that the dubious specimens had nothing to do with *axillena*, but were apparently only a variation of *incesta*, and that basal streaks were seemingly a normal condition of the females but not of the males, and that infuscation of the postcubitals, while not the regular condition in either sex, was not unusual in either males or females in this locality as the following table will show:

Wings wholly clear, males 16, females 1.

Wings with basal streaks only, males none, females 10.

Wings without basal streaks but with infuscated postcubitals, males 3, females 1.

Wings with both basal streaks and infuscated postcubitals, males 1, females 4.

Dividing the whole lot as to absence or presence of basal streaks, we find them present in 14 females and 1 male, and absent in 19 males and 2 females, showing that this particular variation is mainly a sexual one in Raleigh *incesta*.

The basal streaks varied a good deal in different specimens, extending as far as the 7th antecubital in all four wings in one, and in another only as far as the first in the hind wings and the second in the front wings, while others showed every gradation between these. One in which the basal streaks only definitely reached the 6th and 4th antecubitals in the front and hind wings, yet had all the postcubitals and all the antecubitals infuscated, altho there were clear spaces between the veins, so that there was an almost continuous stripe from the base of the wing to the stigma.

From *axillena* the infuscated *incesta* can be distinguished by smaller size, hind wing being about 40 mm. or less, while in *axillena* it seldom runs less than 43 mm., and by the thorax being dark blue pruinose on both sides and dorsum, while in *axillena* it is dark blue on dorsum bordered by black below on sides and below that by yellowish in younger, and by dark brown in older specimens. Also the infuscation is brown, not black as in *axillena*, and is usually more extensive.

C. S. Brimley, Raleigh, North Carolina.

## The Cornell University Entomological Expedition to South America of 1919–20.

Under the leadership of Professor J. Chester Bradley, the Cornell University Entomological Expedition to South America of 1919–20 is carrying on entomological investigation and making collections in various South American countries.

Dr. Bradley sailed for Brazil early in September last on the steamship Vestris; owing to a fire developing in one of the holds of the steamer, a

delay of thirteen days occurred at the Island of Santa Lucia, where interesting and unexpected collecting was done. At Rio de Janeiro he was joined by a volunteer assistant, Mr. R. Gordon Harris.

After spending some time in Rio de Janeiro, a trip was made in company with Brazil's foremost entomologist, Dr. Adolph Lutz, to the State of Minas Geraes in the north, as far as to Pirapora, the head of navigation on the Sao Francisco River; some days were spent at Lassance on the Rio das Velhas as guests of the Institute Oswaldo Cruz. It was at this place that Dr. Chagas first worked out the details of the transmission by a Redwing bug (*Conorhinus*) of a trypanosome causing a very serious endemic disease of the region. Some days were also spent in the alpine meadows at Diamantina, Brazil's highest city, and also as guests of the State of Minas Geraes at the Capitol, Beldo Horizonte.

Returning to Rio de Janeiro, the party proceeded to cross the States of Sao Paulo and Matto Grosso by rail to Corumba on the Paraguay River, and thence to Urucum. Interesting collecting was encountered at various points along this trip, but especially at Urucum, 20 kilometers from Corumba, on an isolated mountain range at an elevation of 2200 feet, at the upper limit of a tropical forest. Here, despite continuous rainy weather, a very interesting and abundant fauna was encountered.

From Corumba they proceeded by rail via Sao Paulo to Uruguayana on the Uruguay River, at the Argentinean frontier, a distance of 2500 miles; from there they were about to proceed, when last heard from, to the falls of the Iguazu on the Alta Parana River.

The plans of the party contemplate spending a brief while in Argentina, at Buenos Aires, La Plata, Cordoba, Mendoza and possibly Tucuman, a visit to Montevideo, and then to spend from six weeks to two months in Chile, visiting several places, to as far south as Chiloe Island; thence to Oruro, Cochabamba and La Paz in Bolivia, and to Lima in Peru.

At Lima, Dr. W. T. M. Forbes and Jesse Williamson will join the expedition, which will, if conditions prove favorable, cross the Andes via the central route and down the Pichis, Pachitea, Ucayalli and Maranon Rivers to Iquitos; stopping at favorable points on the eastern side of the Andes. The party will return to New York in September next.

The Expedition is entrusted with the delivery of extensive collections of North American insects and of vertebrates to four scientific institutions in South America. While not neglecting general collecting, Dr. Bradley is devoting especial attention to the collecting of Hymenoptera, especially of the aculeates, and is endeavoring to obtain series of nests of Vespidae with their inhabitants. Mr. Harris is doing general collecting of insects. Dr. Forbes will devote his attention primarily to Lepidoptera, and relieve the other members of the necessity of devoting attention to this time-exacting group after he joins the Expedition. Mr. Williamson will collect Odonata.

C. R. Crosby, Cornell University, Ithaca, New York.

### The Williamson Expedition in Venezuela

The following note from Mr. E. B. Williamson, dated Puerto Cabello, March 25, 1920, supplements that on page 108 of the April NEWS: "Arrived here this a. m. en route to Maracaibo. Have collected at San Esteban, La Mona, Bejuma, Nirgua, San Felipe and from Barquisimeto and Aroa to Tucacas, finding practically one fauna—one *Heteragrion* and one *Philogenia*. Have 119 spp., 8200+specimens. [Odonata.]"

### Sciocoris microphthalmus Flor. in Northern Michigan (Heterop.)

This little pentatomid is one of the rarest and most interesting members of the North American heteropterous fauna but less than a half dozen definite locality records are known to me at the present time. Van Duzee (Trans. Am. Ent. Soc., XXX, 1904, 32) records a single specimen from the White Mountains in New Hampshire and Parshley (Fauna of New England, 14, 1917, 17) records a specimen from Maine. To these localities I am glad to add another thus making known the further distribution of this insect within our borders.

During the summer of 1919, I took four specimens of *Sciocoris microphthalmus* in the Douglas Lake region of northern Michigan. One of these, a male was taken in the sweep net on July 9, and again on July 18, a male and a female were swept from roadside weeds growing in a wooded area along the edge of a small stream. One nymph, a male about one-third grown, was also taken on July 29, in a similar situation.

Douglas Lake is located in the southern peninsula of Michigan about seventeen miles south of the Straits of Mackinac, the same distance from Lake Huron on the east and Lake Michigan on the west; it is about 200 feet above sea level.—DAYTON STONER, University of Iowa, Iowa City, Iowa.

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## Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in HEAVY-FACED TYPE refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are all grouped at the end of each Order of which they treat.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

**4**—Canadian Entomologist, London, Canada. **5**—Psyche, Cambridge, Mass. **9**—The Entomologist, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **11**—Annals and Magazine of

Natural History, London. **12**—Journal of Economic Entomology, Concord, N. H. **15**—Insecutor Inscitiae Menstruus, Washington, D. C. **17**—Lepidoptera, Boston, Mass. **19**—Bulletin of the Brooklyn Entomological Society. **24**—Annales de la Societe Entomologique de France, Paris. **39**—The Florida Buggist, Gainesville. **45**—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. **46**—Contributions to the Natural History of the Lepidoptera of North America. Ed. by Wm. Barnes. **47**—Neue Beitrage zur systematischen Insektenkunde. Ed. by G. Paganetti Hummler, Voslau. **51**—Archiv fur Mikroskopische Anatomie, Bonn. **52**—Zoologischer Anzeiger, Leipsic. **59**—Journal of Agricultural Research, Washington, D. C. **64**—Parasitology, London. **68**—Science, Lancaster, Pa. **70**—Journal of Morphology, Philadelphia. **71**—Novitates Zoologicae, Tring, England. **82**—The Ohio Journal of Science, Columbus. **86**—The Quarterly Journal of Microscopical Science, London. **89**—Zoologische Jahrbucher, Jena. **103**—Biologisches Centralblatt, Leipzig. **104**—Zeitschrift fur Wissenschaftliche Zoologie. Leipzig.

**GENERAL. Anon**—The Cornell University entomological expedition to South America of 1919–20. **68,** 1920, 342. **Bervoets, R. E.**—Contribution a l'etude du vol des insectes (Ann. Soc. Roy. Zool. et Malacol. Belg., xlviii, 91–126). **Dewitz, J.**—Ueber kunstliche aufebung des spinnens der arthropoden. **52,** 1, 27–30. **Frost, C. A.**—Popular and practical entomology. A day's beating. **4,** lii, 25–9. **Heikertinger, F.** Exakte begriffsfassung und terminologie im problem der mimikry und verwandter erscheinungen. **45,** xv, 57–65 (cont.). Die metoke myrmekoidie. Tatsachenmaterial zur losung des mimikryproblems. **103,** xxxix, 65–102z. **Kathariner, L.**—Das sehen der insekten. **45,** xiv, 1919, 301–304. **Moznette, G. F.**—Annotated list of the injurious and beneficial insects of the avocado in Florida. **39,** iii, 45–48. **O'Kane, W. C.**—The day's work. The opportunity of the daily contacts in the life of a scientific worker. **12,** xiii, 44–59. **Pellett, F. C.**—Adapting system to locality. (Beekeeping.) **12,** xiii, 95–99. **Pierce, W. D.**—Commercial and professional entomology—the future of our profession. **12,** xiii, 117–23. **Stechow, E.**—Supplement zu den indices generum von Scudder 1882 und Waterhouse 1902 und 1912. **89,** Abt. f. Syst., xlii, 173–88. **de la Torre-Bueno, J. R.**—The growth of insect eggs after oviposition. **19,** xv, 24. **Walsingham, Lord**—Obituary notice. **10,** xxii, 41–3.

**GENETICS, ETC. Nachtsheim, H.**—Der mechanismus der vererbung. (Naturwiss. Wochenschift, 1919, 105–14.) **Schmidt, W. J.**—Ueber chromatophoren bei insekten. **51,** xciii, 118–136.

**ARACHNIDA, ETC. Nuttall, G. H. F.**—On coloration in ticks. II. Regeneration of the mouthparts and legs in ticks. **64,** xii, 1–26. Observations on the biology of the Ixodidae. **64,** xi, 393–404.

**NEUROPTERA. Ballowitz, E.**—Ueber die samenkorper der libellen. Die spermien der Agrioniden. **51,** xciii, Abt, 2, 1–14. **Karny, H.**—Synopsis der Megathripidae (Thysanoptera). **47,** i, 105–10, (cont.)

**ORTHOPTERA. Jeziorski, L.**—Der thorax von Dixippus morosus. Ueber das wachstum und wachstumskorrelationen bei Dixippus morosus. **104,** cxviii, 1–24. **Verhoef u. Kleine**—Kann Forficula auricularia fliegen? Hat Periplaneta orientalis einen stridulationsapparat. **45,** xiv, 1918, 85–86. **Yuasa, H.**—The anatomy of the head and mouth parts of Orthoptera and Euplexoptera. **70,** xxxiii, 251–307.

**HEMIPTERA. Davis, W. T.**—The seventeen-year cicada on Long Island, N. Y., in 1919. **19,** xv, 17–18. **Grove, A. J.**—The anatomy of the head and mouth parts of Psylla mali, with some remarks on the function of the labium. **64,** xi, 456–88. **Keilin & Nuttall**—Hermaphroditism and other abnormalities in Pediculus humanus. **64,** xi, 279–328. **Malloch, J. R.**—Notes on some species of the homopterous genus Gypona. **19,** xv, 22–3. **Nuttall, G. H. F.**—The systematic position, synonymy and iconography of Pediculus humanus and Phthirus pubis. **64,** xi, 329–46. **Picaud, A.**—Le cycle biologique du phylloxera. (La Nature, 1920, 65–8.) **Riley, C. F. C.**—Migratory responses of water striders during severe droughts. **19,** xv, 1–10. **Schumacher, F.**—Ueber Psociden-feinde aus der ordnung der Hemipteren. **45,** xiii, 1917, 217–18. **Strindberg, H.**—Zur entwicklungsgeschichte der oviparen coccicden. **52,** l, 113–139.

**Drake, C. J.**—An undescribed water strider from the Adirondacks. **19,** xv, 19–21. Descriptions of new North American Tingidae. **82,** xx, 49–54. **Osborn, H.**—Notes on the generic affinities of certain Cicadellidae. **82,** xx, 153–66.

**LEPIDOPTERA. Busck, A.**—Descriptions of new Central American microlepidoptera. **15,** viii, 83–95. **Cockerell, T. D. A.**—The generic position of Sphinx separatus. **4,** lii, 33–4. **Dyar, H. G.**—New moths from Mexico. A new noctuid from Colombia. **15,** viii, 30–5; 82. **Ehrmann, G. A.**—A new tropical American Papilio. **17,** iv, 13–14. **Frohawk, F. W.**—Retarded development of Coenonympha tiphon. **9,** 1920, 66. **Hampson, G. F.**—On new genera and species of L. Phalaenae, with the characters of two new families. **71,** xxvi, 253–82. **Kaye, W. J.**—A geographical table to show the distribution of the American Papilios. **71,** xxvi, 320–57. **McMurray, N.**—Calocampa nupera. **17,** iv, 14–16. **Moss, A. M.**—The Papilios of Para. **71,** xxvi, 295–319. **Mousley, H.**—The Rhopalocera or butterflies of Hatley, Stanstead County, Quebec, 1919. (Canadian Field Nat., xxxiv, 7–10.) **Prout, L. B.**—New moths in the Joicey collection. **11,** v, 286–93. **Stichel, H.** Nachtrag zu Genera Insectorum, Fasc. 63, Lepidoptera Rhopal. Fam. Nymphalidae, Subfam. Dioninae. **47,** i, 80. **Turner, W. B.**—Lepidoptera at light traps. **59,** xviii, 475–81.

**Barnes & Busck**—Notes and new species. **46,** iv, 211–78. **Braun, A. F.**—New species of Scythris. **4,** lii, 40–1. Notes on Elachista with descriptions of new species. **82,** xx, 167–72. **Dyar, H. G.**—A new noctuid from Arizona. Two new North American moths. **15,** viii, 100–2.

**DIPTERA. Aldrich, J. M.**—European frit fly in North America. **59,** xviii, 451–74. **Collins & Hood**—Life history of Eubiomyia calosomae, a tachinid parasite of Calosoma beetles. **59,** xviii, 483–98. **Dyar, H. G.**—A second Culex of the subgenus Transculicia. Note on the subgenus Neoculex of Culex. A new mosquito from Mexico. **15,** viii, 27–9; 36; 81–3. **Graham-Smith, G. S.**—Further observations on the habits and parasites of common flies. **64,** xi, 347–84. **Keilin, D.**—On the life-history and larval anatomy of Melinda cognata, with an account of the other diptera living upon molluscs. **64,** xi, 430–55. **Koch, A.**—Studien an larven von Culex pipiens bei der submersion. **52,** l, 105–111. **Lindner, H.**—Ueber die mundwerkzeuge einiger dipteren und ihre beziehungen zur ernahrungsweise. **52,** l, 19–27. **Loftin, U. C.**—Mosquitoes found about Gainesville, Fla. **39,** iii, 37–43, 48–50. **Miall & Hammond**—The structure and life history of the Harlequin fly (Chironomus). (Clarendon Press, Oxford, 1900, 196 pp.)

**Dyar, H. G.**—The mosquitoes of British Columbia and Yukon territory, Canada. The species of Choeroporpa, a subgenus of Culex. **15,** viii, 1–27; 54–81. **Johnson, C. W.**—On the variation of Tabanus atratus. **5,** xxvi, 163–65. A new species of the genus Ulidia. **5,** xxvi, 165–66. **Sturtevant, A. H.**—A new species closely resembling Drosophila melanogaster. **5,** xxvi, 153–55.

**COLEOPTERA. Bernhauer, M.**—Beitrag zur Staphylidinen-fauna Sudamerikas. **47,** i, 35–8. Neue arten der gattungen Piestus, Leptochirus und Conosoma aus Sudamerika. **47,** i, 45–53. **Desbordes, H.**—Contribution a la connaissance des Histerides. V. Etude du genre Omalodes. **24,** 1919, 41–64. **Demoll, R.**—Die bedeutung der elytren der kaefer fur den flug. **52,** xxxix, 474–478. **Kremer**—Die flugeldecken der C. **89,** xli, Abt. f. Anat., 175–272. **Luderwaldt, H.**—Biologische notizen ueber brasilianische C. **45,** xii, 1916, 293–98, (cont.). **Obenberger, J.**—Analecta II. Buprestidae (Neotropical). **47,** i, 33–5. **d'Orchymont, A.**—Contribution a l'etude des sous-familles des Sphaeridiinae et des Hydrophilinae. **24,** 1919, 105–68. **Rockwood, L. P.**—Hypera nigrirostris in the Pacific northwest. **4,** lii, 38–9. **Speath, F.**—Drei neue Cassidinen aus dem tropischen Amerika. **47,** i, 122–3. **Verhoeff, K. W.**—Zur systematik der Carabus larven. **45,** xiii, 1917, 41–43. Studien ueber die organisation der Staphylinoidea. **45,** xii, 257–266, (cont.), 1916. **Wheeler, W. M.**—The phoresy of Antherophagus. **5,** xxvi, 145–52.

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**Beaulieu, G.**—Les melasides du Canada. (La Nat. Canadien, xlvi,

186–91, cont.) **Blatchley, W. S.**—Notes on the winter C. of western and southern Florida, with descriptions of new sps. **4,** lii, 42–6. **Chapin, E. A.**—New American Cleridae, with note on the synonymy of Micropterus. **10,** xxii, 50–4. **Cockerell, T. D. A.**—A parasitic of dermestid beetles in entomological collections. **4,** lii, 34. **Obenberger, J.**—Neue exotische Acmaeoderen. **47,** i, 53–56.

**HYMENOPTERA. Armbruster, L.**—Methodisches und kritisches zur geschlechtsbestimmungsfrage bei bienen. **45,** xv, 73–9. **Borner, C.** Stammesgeschichte der hautflugler. **52,** xxxix, 145–186. **Emmelius, C.**—Beitrage zur biologie einiger ameisenarten. **52,** l, 303–311. **Frisch, K. v.**—Ueber den geruchsinn der biene und seine blutenbiologische bedeutung. **89,** xxxvii, Abt. f. allg. Zool. u. Phys., 1–236. **Graham-Smith, G. S.**—(See under Diptera.) **Heikertinger, F.**—Die bienenmimikry von Eristalis. Eine kritische untersuchung. **45,** xiv, 1918, 1–5, (cont.). **Natzmer, G. v.**—Beitrage zur instinctpsychologie der ameisen. **45,** xii, 1916, 288–92. **Phillips, W. J.**—Studies of the life history and habits of the jointworm flies of the genus Harmolita (Isosoma). (U. S. Dept. Agric., Bull. 808.) **Pixell-Goodrich, H. L. M.**—Determination of age in honey-bees. **86,** xliv, 191–206. **Reichensperger, Dr.**—Beobachtungen an ameisen. Ein beitrag zue Pseudogynen. **45,** xiii, 1917, 145–152. **Robertson, C.**—About Bombus americanorum. **19,** xv, 14–16. **Rohwer, S. A.**—The generic name Ceropales Lat. (Jour. Wash. Ac. Sci., x, 171–4.) **Wheeler, W. M.**—The phoresy of Antherophagus. **5,** xxvi, 145–52.

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**Hall, E. W.**—Descriptions of new Tryphoninae of the tribe Ctenopelmini (Ichneumonidae). **5,** xxvi, 155–59. **Mann, W. M.**—A proctotrypid inquiline with Formica exsectoides. **10,** xxii, 59–60. **Rohwer, S. A.**—Descriptions of six new wasps. **10,** xxii, 54–9.

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Philippine Wasp Studies. Part I. Descriptions of New Species by S. A. Rohwer. Part II. Descriptions of New Species and Life History Studies by F. X. Williams. Report of Work of the Experiment Station of the Hawaiian Sugar Planters' Association. Entomological Series, Bulletin No. 14. Honolulu, Hawaii. December, 1919, 186 pp., 106 text figs.—These studies were carried on while Dr. Williams was in the Philippine Islands, from June, 1916, to September, 1917, associated with the work of securing natural enemies of the beetle *Anomala orientalis* and its white grub, a sugar-cane pest on Oahu. Mr. F. Muir discovered that *Scolia manilae* of the Philippines was a desirable parasite of the grub and was able to establish it in the Hawaiian Islands. Dr. Williams adds: "*Scolia manilae* is now far more abundant in the cane fields near Honolulu than we ever found it at Los Baños, Philippines. Indeed, in view of the rapidly disappearing *Anomala orientalis* beetle from the cane fields here and the scattered distribution of the rose-beetle (*Adoretus tenuima-*

*culatus* Waterhouse), one wonders how the wasp manages to remain so plentiful. Mr. O. H. Swezey has found it in the immature stages on *Anomala* grubs in the field, and we have found it in one or two cases on *Adoretus* grubs in a cane field. On Oahu we have caught for distribution many thousands of females" (p. 59).*

Approximately 182 species of Aculeate wasps (including a few Bethylidae), belonging to 18 families, are stated to have been collected in the Philippines; 52 are treated biologically in this paper by Dr. Williams, who describes 13 new species, while Mr. Rohwer describes 16; the new forms are Sphecidae, Psammocharidae (Pompilidae), Vespidae and Thynnidae. A general introduction to the life history and ecological relations of wasps is given by Dr. Williams (pp. 19-31), in which he also describes the locality, Los Baños, Luzon, as ideally situated for the study of insect life. The Philippine College of Agriculture is here and lies immediately at the base of Mt. Makiling, a well forested, ancient volcano, nearly 4000 feet high, with thermal springs flowing from its sides, and offering "at once a study of the lowland and generally more widespread fauna of the cultivated and semi-cultivated areas as well as that of the forest itself." Those who have had the opportunity of studying tropical insect life will congratulate Dr. Williams on the good fortune, which he recognizes, in being able to spend more than a year at such a place, "to make a resident study of many wasp activities and thus observe them from day to day or week to week" and to publish his interesting results. Except to a slight degree, he has not recorded experiments to determine the behavior of the insects under varied conditions—a single year would hardly suffice for this.

As is always to be expected the number of details concerning the life history and habits of the wasps studied which he has been able to record varies greatly from species to species. The fullest data are to be found in his accounts of the Methocas which lay their eggs on tiger-beetle larvae (pp. 69–79); *Macromeris*, *Paragenia* and *Pseudagenia* which provision their nests with spiders (83–103); the Ampulicid *Dolichurus* which gathers roaches (111–117); *Ammobia* and her locustid prey (128–131); the Larridae and crickets (132–139); the Eumenid, *Zethus cyanopterus*, which brings caterpillars to her offspring living in an elaborate nest of leaf-pulp (157–163). Among the Vespinae a description is given of the fragile, pendent nests of *Stenogaster*, that of *S. depressigaster* being of about the dimensions of an ordinary lead pencil, "made up of cells placed in irregular tiers, each consisting of four or five cells, arranged in more or less spiral fashion, the lowest and terminal open passageways or cells now being the only objects of the wasp's solicitude" (168). The nests of this species occur in the forest; " in one or two instances, so close were these frail non-waterproof nests to a waterfall, that the spray frequently struck them and forced the proprietors to edge around to the lee side of their dwellings, to which they habitually cling and where no doubt they rest at night; and after a heavy downpour the swollen stream so aug-

*Cf.* F. Muir, Ann. Ent. Soc. Amer. xii, 171, June, 1919.

mented the cataract, that the nests soaked with water broke up and were abandoned."

A list of more than 120 titles of books and papers bearing on wasp activities closes the 'Studies.'—P. P. CALVERT.

SOME HABITAT RESPONSES OF THE LARGE WATER-STRIDER, *Gerris remigis* Say by C. F. CURTIS RILEY. American Naturalist, vol. LIII, No. 628, pp. 394–414, 1919; vol. LIII, No. 629, pp. 483–505, 1919; vol. LIV, No. 630, pp. 68–83, 1920.—The late Dr. C. Gordon Hewitt in his presidential address before the members of the American Association of Economic Entomologists at their 29th annual meeting in 1916, called attention to insect behavior as a factor in applied entomology and to the need of further work along such a fundamental line. Papers on insect behavior are not common in entomological journals and for this reason, attention is hereby called to Prof. Riley's series of papers in *The American Naturalist.* These treat of certain habitat responses of apterous forms of the large water-strider, *Gerris remigis* Say, the observations and experiments having been made in Illinois and New York. Various observations are recorded on the responses of water-striders trapped in stream pools during a period of severe drought. It was found that during a severe drought, as food became scarce or when a scum formed on the surfaces of some pools, the gerrids migrated by way of the riffles to pools that were free of scum. As the drought progressed the striders congregated on the few pools that remained. After the pools dried up, the insects left them after a short length of time but not immediately and sought other pools. Frequently, shade and lower temperatures induced the gerrids to stay quietly but temporarily beneath clumps of dead leaves, stones, etc. They did not aestivate Riley states that the gerrids appeared to find other pools by a blundering method of trial and error.

Fifty percent of a total number of gerrids entrapped on the surface of a certain stream pool were successful in reaching water elsewhere ten yards away. On other occasions much smaller percentages were able to find water after the pools on which they were confined had become dry. In some cases the water was less than ten yards away and in others it was eleven, twelve and fourteen yards distant. During periods of long and severe droughts it is believed that large numbers of apterous individuals die. Various experiments were performed for the purpose of finding out whether water-striders were able to reach their habitat after having been removed from it and placed on the ground certain distances away. Individuals were headed away, toward and parallel to the water and in all cases up to certain distances, the majority of the insects reached the water. An experiment to discover whether moisture, vision, or both factors functioned as stimuli in influencing the water striders to find the brook was inconclusive, due to the failure of the barrier to shut off the view of the stream and this is the only defect, if it can

be called such, in Prof. Riley's interesting paper. The author realizes this but is strongly of the opinion that vision is the important factor, altho moisture also may have exerted an influence on their responses.

Prof. Riley's descriptions of the physical conditions surrounding the habitats of the insects and the photographs accompanying the papers help the reader to visualize the conditions under which the observations and experiments were made and are of considerable value for comparative purposes to other workers in animal behavior. In the entire paper the experiments are reported in some detail and the conclusions discussed at length, furthermore the observations are checked up and compared with those of other writers in the same field. The details are of considerable interest and value as is the entire paper, moreover such details are essential to a complete presentation of behavior studies. A bibliography of 18 titles accompanies the paper.—Harry B. Weiss, New Brunswick, New Jersey.

## Obituary

### Lord Walsingham.

Thomas de Grey, sixth Baron Walsingham, the great authority on the Microlepidoptera of the world, died on December 3, 1919, as the result of heart-failure, following pleurisy, due to a chill contracted in connection with going to Cambridge for the installation of Mr. Balfour as chancellor of the University. From obituary notices in *The Entomologist's Monthly Magazine* for February (with portrait) and *The Entomologist* for January, we summarize as follows: He was born in Mayfair, London, July 29, 1843, went to Eton in 1856, and to Trinity College, Cambridge, in 1860. The University made him B. A. in 1865, M. A. in 1870 and High Steward and LL. D., in 1891. He was a member of the House of Commons for West Norfolk, 1865-1870, succeeding to the title and estates of his father in the latter year. He was appointed a Trustee of the British Museum in 1876 and to it he gave his entomological library and collections in 1910. These consisted very largely of Lepidoptera, both imagines and larvae, especially of the Microlepidoptera.

He must have collected more than 50,000 specimens of Microlepidoptera in England, France, Monte Carlo, Italy, Spain, Sicily, Corfu, Germany, Austria, Algeria, Morocco, the Canaries, California and Oregon, Jamaica,

etc., breeding thousands of specimens, the life-history of many of which he discovered, and describing numerous new species and purchasing at various dates the "micros" in the Zeller, Hofmann, Christoph and other collections.

Commencing as a British Lepidopterist, he was undoubtedly influenced in his early studies in the Tineina by Stainton, who induced him to extend those studies beyond the British fauna. When preparing his North American Tortricidae (published 1879) Lord Walsingham had much correspondence with Professor C. H. Fernald, and being dissatisfied with the Wilkinsonian system was easily persuaded by Fernald to adopt that of Heinemann—and described many genera founded on secondary sexual characters. He was liberal minded enough in his 65th year, in association with Mr. August Busck and the writer to repudiate all such genera and they were freely sacrificed in the "Biologia!" Lord Walsingham readily accepted the more exact methods of study and classification which we owe to Mr. E. Meyrick, with a natural reservation as to matters of detail, such as sequence and nomenclature [J. H. Durrant in Ent. Mo. Mag.].

He was elected a Fellow of the Royal Society in 1887, and President of the Entomological Society of London, 1889-90.

As indicated above, he collected in California and Oregon. This was in 1871 and 1872. As a result of this expedition, the largest species of dragonfly known in the United States bears the name *Anax walsinghami*, given to it, in honor of the collector, by Robert M'Lachlan in the Ent. Mo. Mag. for 1883.

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*The Entomologist's Monthly Magazine* also records the deaths of WILLIAM E. SHARP (1856-May 20, 1919), "one of the best of our British Coleopterists;" Major THOMAS BROUN, Coleopterist and for some time Government Entomologist of New Zealand at Auckland, August 24, 1919; BRUCE F. CUMMINGS, on the entomological staff of the British Museum, 1912–1917, and who wrote mainly on Anoplura and Mallophaga, on October 22, 1919; and FREDERICK HERSCHEL WATERHOUSE, coleopterist (Oct. 4, 1845–March 12, 1919), last surviving son of G. R. Waterhouse, and librarian of the Zoological Society of London, 1872–1912.

### EMILY L. MORTON.

Emily L. Morton passed away at her home, New Windsor, New York, on the evening of January 8th, 1920, after an

illness of nearly six months. There she was born on the 3rd of April, 1841, on the beautiful estate overlooking the Hudson which had been owned by her family for four generations. Her whole life had been devoted to the study of Lepidoptera and, although she published nothing herself, her work lives after her in the writings of W. H. Edwards, Prof. A. S. Packard and others, particularly in illustrations of the larval stage of various butterflies and moths, for she was a very clever artist.

It was she who worked out the curious life-history of *Feniseca tarquinius* Fabr., the larvae of which feed upon the mealy bugs that inhabit the alder. She also was among the first to hybridize the Saturniidae.

Her sister, Miss Charlotte A. Morton, the sole surviving member of her immediate family, writes me as follows: "At your request I have written out briefly a short account of my sister's last days, but no one knows how patiently she bore the great suffering entailed by her illness. During the late summer of 1919, she began to suffer from the illness which afterward ended her life. Her ankles became swollen and gave her much pain and she grew very weak and thin and seemed in many ways older than her years. About the middle of December, she became too ill to do anything, tho up to this time she had made hundreds of picture puzzles for sick soldiers. Almost the last thing she did was to pack one of these for a sick friend. Altho carefully attended by her nurses and myself she grew rapidly worse, suffering greatly until the end."

An account of Miss Morton's early life and entomological studies will be found in the March, 1917, number of this publication.

She was almost the last of that brilliant group of Entomologists who did so much for this fascinating study in the latter half of the past century.

H. H. Newcomb, Pasadena, California.

# EXCHANGES.

**This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.**

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

**Lepidoptera**—*Papaipema arctivorens, eryngii, furcata, circumlucens, pterisii* and *silphii, Apamea immanis* and other Lepidoptera to exchange for fresh mounted specimens. Alex. K. Wyatt, 2445 Eastwood Ave., Chicago, Ill.

**Wanted**—Journal of Economic Entomology, Vol. I, No. 2. H. R. Painter, U. S. Entomological Laboratory, 628 Yeddo Ave., Webster Groves, Mo.

**Wanted**—All Saturnians, particularly Hemileucids, and material for breeding them. Offer—*Ornithoptera, Papilio, Hemileuca maia lucina, Pseudohazis eglanterina, shastaensis, hera;* Pupae of *Marumba, Sphinx cerysii* and *gordius, Panthea, Pheosia;* Ova of *Catocala relicta;* etc., and cash. J. D. Sornborger, Rowley, Mass.

**Wanted**—To purchase literature on Aphididae. Send list to A. C. Baker, East Falls Church, Va.

**Will** exchange many entomological items for others not in my library, or will buy unusual items of practical value. Can use a photomicrographic lens. J. E. Hallinen, Cooperton, Okla.

**Wanted**—For cash, or exchange, papers on insect biology, ecology or behavior (especially aculeate Hymenoptera). P. Rau, 2819 S. Kings highway, St. Louis, Mo

**Brachynus** wanted for cash or exchange from any part of North America. J. W. Green, 520 McCartney St., Easton, Pa.

**Lepidoptera Hesperidae** wanted.—I will purchase or exchange and also name specimens. South American species particularly desired. Henry Skinner, Logan Square, Philadelphia, Pa.

**For Exchange**—Iowa Catocalae in A-1 condition. Wanted, Cocoons of Actias luna also other lepidoptera. Mrs. O. F. Hiser, Arnolds Park, Iowa.

**Will go to Kauai** Island, T. H., to collect insects, etc., in highest altitude, about end of April. Would like some good collector to go along for company. Have been there twice last year. Address, J. Aug. Kusche, Burlingame, San Mateo Co., Cal.

**Lepidoptera**—Offer many Western species and will collect next month in Colorado desert, S. E. Cal., will exchange or purchase. Desire rarer Noctuids, fresh, full data. Chas. A. Hill, 644 West 36th St., Los Angeles, Cal.

**Books Wanted**—Entomological News, Vol. 11, Nos. 1, 3, 5; Vol. 14, Nos. 1, 7. Brooklyn Museum Library, Eastern Parkway and Washington Ave., Brooklyn, N. Y.

**Wanted**—N. A. Coleopterists interested in European Coleoptera. liberal exchanges and friendly correspondence. Mr. C. Crozet, 155, Via Cavour, Rome, 23, Italy.

**Japanees** and Formosan Butterflies will be exchanged by S. Satake, 48, Aoyama-minami-machi, 5-chome Tokyo, Japan.

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